UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL RESPONSE BRANCH
Edison, New Jersey 08837

May 22, 1992

Mr. Paul Groulx, OSC
Response and Preparedness Branch
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60 Westview Street
Lexington, Massachusetts 02173

Dear Paul,

Attached is a copy of the report for the Harco Site in Wilton, Connecticut, that addresses the work that was performed at your request.

The following is my synoptic treatment of the report, plus some additional comments that I feel are pertinent to the project in light of our recent telephone conversations.

The primary objective of this work was to evaluate the treatment/removal alternatives that was feasible for the Harco waste, including solidification and waste minimization through separation. You had also requested that we provide you with some cleanup goals for the lead and zinc contaminated soil at the Harco Site that would minimize the potential for further stream contamination resulting from surface and subsurface leaching of heavy metals into the adjacent stream.

On March 24, 1992, we collected samples for the treatability study at four locations which we determined to be representative of heterogeneity of the waste distribution on site. The physical appearance of soils, representing the different locations on the site, indicates that three different types of soil were collected. One of the samples was not a naturally occurring material and has the characteristics of plating sludges. Nodules in the sludge broke apart easily and could not be separated by sieving (i.e., passed through the sieves with the remaining material). The wood fragments found in the soil in the area where this particular sample was collected had a sufficient quantity of wood pieces and fragments that must be addressed in a waste minimization step prior to treatment of the soil.

The relatively small percentage of material retained on a 9.5 mm screen indicates that the gravel on-site is too small to be screened out of the contaminated soil. The nodules of metallic material interspersed with the coarse sand could not be separated from the sand by sieving.

The XRF analytical results show an apparent correlation between the zinc and lead concentrations in the soil samples. The lead concentration is between 10% and 15% of the zinc concentration in the four soil samples. The lead concentration ranged from 400 mg/kg to 15,000 mg/kg, while the zinc concentrations ranged from 4,400 mg/kg to 150,000 mg/kg. The metal concentrations present indicate that all areas sampled were contaminated to some extent by the plating sludges. It is also important to note that there are significant concentrations of copper, chromium and nickel in the waste sludge throughout the site.

The solidification studies showed that a mixture of 15% cement is adequate to achieve the regulatory requirement specifying that the TCLP lead concentration be equal to or less than 5.0 mg/l with the exception of the sample from Area 4 which had a concentration of 6.84 ppm. The TCLP results for the 30% and 45% mixtures of all samples met the regulatory requirement completely.

The published cleanup targets for zinc range from 220 to 1500 mg/kg. The acceptable soil level in the state of New Jersey is 350 mg/kg. The likelihood of migration of zinc into surface waters is highly dependent on the compounds of zinc, the acidity of the groundwater and runoff, and the permeability of the soil. Typical zinc salts ($ZnSO_4$, $ZnCl_2$) are more soluble than the corresponding lead salts. This information, in conjunction with the fact that the zinc concentrations in the soil are ten times higher than the lead concentration, indicates that the cleanup goal for zinc will probably be the controlling factor in the removal action. A practical zinc target for soil remaining in place after excavation of the highly contaminated material at the Harco Site can be based on targets that have been used in California (250 mg/kg) and New Jersey (350 mg/kg).

In respect to minimizing the waste volume, the wood debris should be separated from the contaminated soil in the Area 4. This can be achieved by either screening or flotation. Seventy to eighty percent of the sample volumes were below the 9.55 mm screen size, however, I noted during the site visit the presence of gravel and cobble size stones throughout the site. Physical separation of the soils into gravels is recommended in order to minimize the amount waste that will require solidification. From this study, it can be concluded that it might be cost effective to establish different staging areas so that waste minimization and economical mix of solidification agents can be implemented.

It is feasible that removal of the most contaminated soils be performed following separation and de-watering has been accomplished on-site being that to bring solidification materials (cement) and water would not be cost-effective nor logistically feasible given the condition of the access road.

If you have any questions regarding this memorandum or the attached report, please contact me. As always, it has been very enjoyable working with you and I look forward to hearing from you in the near future.

Sincerely yours,

Royal J. Nadeau, Ph.D.

Attachment